water, the solution on cooling depositing white silky needles of oxalurate of silver. The lead compound produced by adding acetate of lead to the watery solution, forms well-defined prismatic crystals. With chloride of calcium the watery solution gives no precipitate, but on adding ammonia and boiling, there is an abundant precipitation of oxalate of lime. By treatment with strong acids the substance is decomposed, yielding oxalic acid and urea. Its composition was found to correspond with the formula $C_6 H_7 N_3 O_8$, which is that of oxalurate of ammonia.

The author's experiments were not sufficiently numerous to decide the question whether this salt is a normal constituent of human urine or not. There is no doubt, however, that its presence, whether exceptional or not, affords an easy and satisfactory explanation of a phenomenon which has until now proved very puzzling, viz., the formation of oxalate of lime in urine long after its emission. It is doubtless owing to the decomposition of oxaluric acid, which takes up water and splits up into urea and oxalic acid; the latter then combines with lime, of which there is always a sufficient quantity present to saturate the acid. There can be little doubt also that oxaluric acid is derived in the animal frame, as in the laboratory, from uric acid, the oxidation of which is its only known source.

VI. "On the Structure of the Optic Lobes of the Cuttle-Fish." By J. Lockhart Clarke, F.R.S. Received September 26, 1866.

(Abstract.)

The brain of the Cuttle-fish consists of several ganglia closely aggregated around the upper part of the œsophagus. The foremost or pharyngeal ganglion, which is much the smallest, is bilobed and somewhat quadrangular. The next is a large bilobed ganglion which forms the roof of the canal for the œsophagus. Beneath the œsophagus is another large and broad mass, which is connected on each side with the supra-œsophageal masses by bands that complete the œsophageal ring.

From each side of the cephalic masses springs a thick optic peduncle which ends in the optic lobe. Each optic lobe is larger than all the other cerebral masses taken together, and has a striking resemblance in shape to the human kidney. It is completely enveloped in a thick layer of optic nerves disposed in flattened bands which issue from all parts of its substance and proceed to the back of the eye in a fan-like expansion, the upper and lower bands crossing each other in their course. The substance of each lobe consists of two distinct portions, which differ from each other entirely in appearance. The outer portion resembles a very thin rind or shell, is extremely delicate, and very easily torn from the central substance which it encloses. It consists of three concentric layers—an external dark layer, an internal dark layer, and a middle pale and broader layer containing thin and concentric bands of fibres.

The first or outer layer consists of a multitude of nuclei and a few small

nucleated cells, with which filaments of the optic nerves are connected. The second or middle layer is composed entirely of fine nerve-fibres which form two sets—one vertical, and the other horizontal. The vertical fibres issue at the under surface of the first layer from the network which its nuclei form with the fibres of the optic nerves. Some are continuous with the horizontal fibres, but the majority continue downward across them to the third or inner layer. At the junction of these two layers is a row of nucleated cells which send thin processes in different directions, and with which some of the nerve-fibres are connected. The third or inner layer is composed entirely of closely-aggregated nuclei, which are joined together in a network by the fibres which issue from the under surface of the middle layer.

The cortical substance, consisting of these three layers, forms only a very small portion of the optic lobe. Out of the nuclear network of the inner layer fine nerve-fibres descend into the body of the lobe which it encloses. At first these fibres are vertical, parallel, and arranged in uniform series, with scattered nuclei between them; but as they descend to the centre of the lobe, they diverge more and more, and cross each other to form a plexus, first with oval and then with broader meshes, in which the nuclei and nucleated cells are collected into groups of corresponding shape and size.

From the plexus at the inner side of the lobe bundles converge from all parts to form the lower half of the peduncle, the upper part of which consists of masses of small nuclei, and gives attachment, by a short pedicle, to a small tubercle. This tubercle consists of closely-aggregated nuclei connected by fibres which converge to its neck and escape into the peduncle of the optic lobe.

After concluding his description of the optic lobes, the author gives a short account of the structure and connexions of the remaining cerebral ganglia of the Cuttle-fish, with the view of determining their homologies.

From the nature of the parts which it supplies, the foremost or pharyngeal ganglion would seem to combine the function of the centres which give origin to the trigeminal, the olfactory, and the gustatory nerves in the vertebrata. The second bilobed ganglion appears to correspond partly to the cerebral lobes and partly to the cerebellum of fishes. The posterior portion of the subœsophageal mass is the analogue of the medulla oblongata; while the anterior portion may be regarded as the spinal cord concentrated below the œsophagus and in the neighbourhood of the feet, which derive all their nerves from that source.